CLAIMS

What is claimed is:

1. An aluminum alloy product having high strength with good toughness, containing by weight, 8.5-11.0% Zn, 1.8-2.4 % Mg, 1.8-2.6% Cu, 0.05-0.30% Sc and at least one element from the group Zr, V, or Hf not exceeding about 0.5%, the balance substantially aluminum and incidental impurities.

2. The alloy product of claim 1, wherein said alloy contains about 0.03-0.25% Zr.

3. The alloy product of claim 1, wherein said alloy includes 8.8-10.2% Zn, 1.8-2.2% Mg and 2.0-2.4% Cu.

4. The alloy product of claim 3, wherein said alloy includes 0.05-0.10% Sc.

5. The alloy product of claim 4, wherein said alloy includes 0.06% Sc.

6. The alloy product of claim 1, wherein said alloy includes 9.0-10.0% Zn, 1.8-2.2% Mg, 2.0-2.4% Cu and 0.05-0.10% Sc.

7. The alloy product of claim 1, wherein said alloy includes 0.06% Sc.

8. The alloy product of claim 1, wherein said alloy includes about 0.03-0.10% Si and 0.03-0.12% Fe.

9. The aluminum alloy product of claim 1, wherein said product is selected from the group including sporting goods such as baseball and soft ball bats, golf shafts, lacrosse sticks, tennis rackets, and arrows; aerospace components such as wing plates, bulkheads, fuselage stringers, and structural extrusions and forgings; and ordnance parts such as sabots and missile launchers.

10. A process for making an aluminum alloy product containing at least Al, Zn, Mg and Cu, said method including the steps of:

casting said alloy product to form an alloy ingot; and

homogenizing said alloy ingot to minimize the amount of low melting point eutectic phases therein by heating said ingot at a heating rate of no more than 20°F/hr. from a first temperature at least about 20°F below the melting temperature of said ingot to a second temperature of about 5°F below said melting temperature.

11. The process of claim 10, wherein said first temperature is about 30°F below said melting temperature.

12. The process of claim 10, wherein said first temperature is selected to be about 870°F and said second temperature is selected to be in the range of 885-890°F.

11. The process of claim 10 where the alloy ingot is held at said first temperature for at least 8 hours.

12. The process of claim 10, further comprising the step of solution heat treating the alloy ingot at said second temperature.

13. The process of claim 10, wherein said alloy ingot contains 8.5-11.0% Zn, 1.8-2.4 % Mg, 1.8-2.5% Cu, and at least one element from the group Zr, V, or Hf not exceeding about 0.5%, the balance substantially aluminum and incidental impurities.

14. The process of claim 13, wherein said alloy contains 0.05-0.30 % Sc.

15. The process of claim 13, wherein said alloy contains about 0.03-0.25% Zr.

16. The process of claim 15, wherein said alloy contains 0.05-0.30 % Sc.

17. The process of claim 13, wherein said alloy ingot contains 8.8-10.2% Zn, 1.8 2.2% Mg and 2.0-2.4% Cu.

18. The process of claim 17, wherein said alloy ingot contains 9.0-10.0% Zn, 1.8-2.2% Mg and 2.0-2.4% Cu.

19. The process of claim 18, wherein said alloy includes 0.05-0.10% Sc.

20. The process of claim 19, wherein said alloy includes 0.06% Sc.

21. The process of claim 17, wherein said alloy includes 0.05-0.10% Sc.

22. The process of claim 21, wherein said alloy includes 0.06% Sc.

23. An aluminum alloy product having high strength with good toughness, containing by weight, 9.0-11.0% Zn, 1.8-2.4 % Mg, 2.2-2.6% Cu and at least one element from the group Zr, V, or Hf not exceeding about 0.5%, the balance substantially aluminum and incidental impurities.

24. The alloy product of claim 23, wherein said alloy contains about 0.03-0.25% Zr.

25. The alloy product of claim 23, wherein said alloy includes 9.0-10.2% Zn, 1.8-2.2% Mg and 2.2-2.4% Cu.

26. The alloy product of claim 25, wherein said alloy includes 0.05-0.10% Sc.

27. The alloy product of claim 26, wherein said alloy includes 0.06% Sc.

28. The alloy product of claim 23, wherein said alloy includes 9.0-10.0% Zn, 1.8-2.2% Mg, 2.2-2.4% Cu and 0.05-0.10% Sc.

29. The alloy product of claim 23, wherein said alloy includes 0.06% Sc.

30. The alloy product of claim 23, wherein said alloy includes about 0.03-0.10% Si and 0.03-0.12% Fe.

31. The aluminum alloy product of claim 23, wherein said product is selected from the group including sporting goods such as baseball and soft ball bats, golf shafts, lacrosse sticks, tennis rackets, and arrows; aerospace components such as wing plates, bulkheads, fuselage stringers, and structural extrusions and forgings; and ordnance parts such as sabots and missile launchers.